International Journal of Research in Finance and Management

P-ISSN: 2617-5754
E-ISSN: 2617-5762
IJRFM 2025; 8(1): 467-472
www.allfinancejournal.com
Received: 03-10-2024
Accepted: 09-11-2024

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Risk and return analysis of financial services in India using the Sharpe ratio: A sectoral comparison with nifty financial services index

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DOI: https://www.doi.org/10.33545/26175754.2025.v8.i1e.469

Abstract
This study evaluates the risk-adjusted performance of financial services stocks in India using the Sharpe Ratio, comparing them against the Nifty Financial Services Index (NIFTYFIN). The analysis covers the period from 2020 to 2024, incorporating annual return data, standard deviation, and a risk-free rate of 6.69% based on the 10-year Indian government bond yield. The results indicate that Cholamandalam Investment & Finance (CHLA), ICICI Bank (ICBK), and Muthoot Finance (MCEI) delivered the highest risk-adjusted returns, with Sharpe Ratios surpassing the benchmark index. Conversely, stocks such as SBI Cards (SBIC) and HDFC Life (HDFL) exhibited negative Sharpe Ratios, indicating returns lower than the risk-free rate. The sector-wide comparison highlights that a few select firms outperformed NIFTYFIN in terms of risk-adjusted returns, whereas others failed to compensate for the risks undertaken. These findings provide valuable insights for investors and portfolio managers seeking to optimize financial sector investments. The study emphasizes the importance of risk-adjusted performance metrics in decision-making and underscores the role of Sharpe Ratios in evaluating investment attractiveness within the Indian financial services sector.

Keyword: Risk-return analysis, Sharpe ratio, financial services, nifty financial services index, risk-adjusted returns, quantitative analysis, benchmark comparison

1. Introduction
The financial services sector is a crucial component of the Indian economy, significantly impacting investment strategies, capital flow, and market stability. Investors constantly seek to maximize returns while minimizing risk, making it essential to evaluate the performance of financial stocks beyond absolute returns. Traditional return measures often overlook the risk component, necessitating the use of risk-adjusted performance metrics. This study employs the Sharpe Ratio, a widely accepted tool for assessing risk-adjusted returns, to analyze the performance of selected financial services stocks in India. By comparing these stocks against the Nifty Financial Services Index, the research aims to determine which securities offer the most favourable return-to-risk ratio. Key statistical parameters, including mean returns, standard deviation, skewness, and kurtosis, are examined to gain deeper insights into market behaviour. The findings of this study provide valuable guidance for investors, financial analysts, and portfolio managers in making informed investment decisions within the financial sector.

2. Review of Literature
The financial services sector plays a pivotal role in shaping economic growth, investment patterns, and risk management strategies. Numerous studies have been conducted to assess the performance of financial stocks using risk-adjusted metrics, particularly the Sharpe Ratio. This review highlights key contributions to the field, with a specific focus on risk-return analysis, stock market efficiency, and financial performance evaluation.
Sharpe (1966) [9] introduced the Sharpe Ratio, a widely used metric for evaluating the risk-adjusted returns of investment portfolios. This measure enables investors to compare different asset classes by considering both return and volatility, providing a standardized

approach to performance assessment (Sharpe, 1966) [9]. Basu (1977) [1] challenged the Efficient Market Hypothesis (EMH) by demonstrating that value stocks—including financial sector stocks—tend to outperform growth stocks over extended periods. His research suggested that market inefficiencies allow for excess returns in specific sectors (Basu, 1977) [1]. Fama and French (1993) [3] expanded upon traditional risk models by introducing the three-factor model, incorporating market risk, size, and value effects. Their findings highlighted that financial stocks exhibit systematic risk variations, making risk-adjusted performance crucial for assessing their value (Fama & French, 1993) [3]. Shefrin and Statman (2000) [10] examined behavioural biases in investment decision-making, emphasizing that psychological factors lead investors to misinterpret risk-adjusted returns. Their study underscored the importance of behavioural finance in portfolio performance (Shefrin & Statman, 2000) [10]. Reilly and Brown (2011) [7] analyzed the role of financial stocks in mutual fund portfolios, revealing that stocks with high Sharpe Ratios often attract institutional investors. Their study indicated that mutual funds tend to allocate capital toward financial stocks with strong risk-adjusted returns, influencing market trends (Reilly & Brown, 2011) [7]. Bhattacharya and Roy (2019) [2] examined the effect of regulatory changes on financial stock volatility, concluding that government interventions and monetary policies significantly impact risk-adjusted stock returns. Their research highlighted the importance of regulatory stability in the financial sector (Bhattacharya & Roy, 2019) [2]. Gupta and Aggarwal (2020) [4] conducted a sector-wide study of Indian financial services firms, revealing that although some financial stocks generated high absolute returns, their Sharpe Ratios remained lower than benchmark indices due to increased volatility (Gupta & Aggarwal, 2020) [4]. Sehgal and Tripathi (2021) [8] analyzed the risk-return dynamics of individual financial stocks relative to the Nifty Financial Services Index. Their findings suggested that while certain stocks perform well during bullish phases, the index provides more stable risk-adjusted returns over time (Sehgal & Tripathi, 2021) [8]. Kumar and Sharma (2022) [5] studied the relationship between interest rate fluctuations and financial stock performance. They found that rising interest rates generally lead to lower Sharpe Ratios for financial firms due to increasing borrowing costs, impacting profitability (Kumar & Sharma, 2022) [5]. Ranganathan and Iyer (2023) [6] examined financial sector performance in emerging markets, showing that higher volatility leads to lower Sharpe Ratios compared to developed economies. Their study emphasized the importance of sector-specific investment strategies in volatile financial markets (Ranganathan & Iyer, 2023) [6].

3. Statement of the problem

Investors in the financial services sector often struggle to identify stocks that offer the best returns while effectively managing risk. Relying solely on traditional return-based analysis may not provide a clear picture of a stock's overall performance, as it does not account for volatility. This lack of a risk-adjusted assessment can lead to inefficient investment choices. To bridge this gap, the study evaluates the risk-return dynamics of financial services stocks in India using the Sharpe Ratio. By comparing individual stock performance with the Nifty Financial Services Index, the research aims to offer data-driven insights that assist investors in making well-informed decisions.

4. Research Gap

While several studies have analyzed the performance of financial markets, there is a lack of focused research on the risk-adjusted returns of financial services stocks in India using the Sharpe Ratio. Many existing analyses emphasize absolute returns or conventional valuation techniques without adequately considering the balance between risk and return. Furthermore, although indices like the Nifty Financial Services Index provide an overall sector performance measure, limited research has compared individual stock performance against this benchmark. This study addresses this gap by evaluating the risk-adjusted returns of financial stocks and benchmarking them against the sector, providing valuable insights for investors and policymakers.

5. Objectives

1. To analyze the risk and return characteristics of selected financial services stocks in India.
2. To evaluate the performance of these stocks using the Sharpe Ratio as a measure of risk-adjusted returns.
3. To compare individual financial stocks with the Nifty Financial Services Index to assess sector-wide performance.
4. To identify the top-performing financial stocks based on their risk-return trade-off.
5. To provide insights into investment decisions by analysing the relative risk and return profiles of financial services stocks.
6. To highlight the significance of quantitative measures in assessing stock market performance.

6. Research Methodology

A. Research Design

This study adopts a quantitative research approach to evaluate the risk and return characteristics of financial services stocks in India using the Sharpe Ratio. The research employs financial and statistical techniques to analyze risk-adjusted returns of selected financial stocks, with the Nifty Financial Services Index serving as the benchmark for comparison.

B. Data Collection

Type of Data: The study relies on secondary data.
Sources: Stock price and index data are gathered from NSE India, Investing.com Finance
Time Frame: The analysis covers the period from 2020 to 2024 to assess long-term performance trends.
Key Variables: The study considers stock returns, Nifty Financial Services Index returns, risk-free rate (measured by the 10-year government bond yield), and the standard deviation of returns.

C. Sampling Method

A total of 20 financial service companies listed on the NSE are included in the study.
Selection is based on market capitalization, trading volume,

and sectoral representation to ensure a comprehensive analysis.

D. Data Analysis Techniques

Sharpe Ratio Computation:

The Sharpe Ratio is calculated using the following formula:

$$Sharpe\ Ratio = \frac{(R_p - R_f)}{\sigma_p}$$

Where:

R_p= Average return of the stock

R_f= Risk-free return (10-year government bond yield)

σ_p = Standard deviation of stock returns

Benchmark Comparison

The Sharpe Ratios of individual financial stocks are compared with the Nifty Financial Services Index to assess risk-adjusted performance.

Stock Ranking

Financial stocks are ranked based on Sharpe Ratios, identifying top performers in terms of risk-adjusted returns.

Sector Performance Evaluation

The overall sector's risk-return characteristics are analyzed to determine whether financial services stocks, on average, outperform or underperform the broader financial index.

E. Analytical Tools Used

Microsoft Excel is used for data processing, return calculations, and Sharpe Ratio computation, while IBM SPSS 25 is utilized for statistical analysis, including descriptive statistics and stock ranking based on risk-adjusted returns.

F. Scope & Limitations

The scope of this study is limited to publicly listed financial services companies in India, providing insights into their risk-adjusted performance using the Sharpe Ratio. The analysis relies on historical data, which may not necessarily predict future market behavior, as stock performance is influenced by dynamic economic conditions. Additionally, while the study focuses on evaluating returns and risk levels, it does not explicitly incorporate external macroeconomic factors such as inflation, monetary policies, or interest rate fluctuations. However, these external elements may have an indirect impact on the findings, influencing market trends and stock volatility.

7. Data Analysis & Interpretation

This section presents a comprehensive analysis of the financial performance of publicly listed financial services companies in India. The study utilizes historical return data to evaluate the risk-return characteristics of selected stocks. Microsoft Excel and IBM SPSS 25 have been employed for data processing, return calculations, and statistical analysis. Key descriptive statistics, including mean, standard deviation, skewness, and kurtosis, are computed to assess volatility and return patterns. The findings from this analysis provide valuable insights into market behavior, enabling a comparative assessment of financial stocks and their risk-adjusted performance.

Table 1: Performance Comparison of Financial Stocks and Nifty Financial Services Index

Stock	2020	2021	2022	2023	2024
AXIS	-17.72%	9.36%	37.61%	18.05%	-3.41%
BJFN	25.04%	31.77%	-5.76%	11.45%	-6.89%
BJFS	-5.18%	84.21%	-5.65%	8.91%	-6.98%
CHLA	26.89%	34.24%	38.91%	74.27%	-5.86%
HDBK	12.91%	3.00%	10.05%	4.98%	3.72%
HDFA	-8.80%	-16.17%	-10.82%	46.92%	31.02%
HDFL	8.06%	-3.98%	-12.82%	14.21%	-4.58%
ICBK	-0.71%	38.33%	20.36%	11.87%	28.60%
ICIL	9.67%	-7.86%	-11.74%	14.82%	25.89%
ICIR	3.40%	12.42%	-19.53%	18.51%	22.44%
KTKM	18.48%	-10.00%	1.73%	4.42%	-6.40%
LICH	-16.79%	2.33%	12.04%	29.45%	11.56%
MCEI	48.17%	-8.55%	-1.81%	105.88%	94.82%
MUTT	58.98%	23.55%	-28.92%	38.87%	44.70%
PWFC	-3.05%	4.77%	17.87%	238.82%	17.22%
RECM	-6.42%	-0.08%	16.09%	254.38%	21.28%
SBI	-17.62%	67.47%	33.28%	4.62%	23.81%
SBIC	-	9.06%	-14.29%	-4.51%	-12.61%
SBIL	-5.96%	32.26%	2.95%	16.35%	-2.95%
SHMF	-8.29%	16.29%	13.14%	49.12%	40.71%
Nifty Financial Services Index	4.47%	13.96%	9.52%	13.20%	9.43%

Source: Author Calculation

Table 2: Descriptive Statistics of Financial Services Stocks

Stock	Minimum Return	Maximum Return	Mean Return	Std. Deviation	Skewness	Std. Error (Skewness)	Kurtosis	Std. Error (Kurtosis)
AXIS	-17.72%	37.61%	8.78%	21.03%	0.195	0.913	-0.238	2
BJFN	-6.89%	31.77%	11.12%	17.53%	0.065	0.913	-2.632	2
BJFS	-6.98%	84.21%	15.06%	39.19%	2.094	0.913	4.426	2
CHLA	-5.86%	74.27%	33.69%	28.66%	0.085	0.913	1.567	2
HDBK	3.00%	12.91%	6.93%	4.33%	0.731	0.913	-1.851	2
HDFA	-16.17%	46.92%	8.43%	28.57%	0.74	0.913	-2.282	2
HDFL	-12.82%	14.21%	0.18%	10.82%	0.289	0.913	-1.424	2
ICBK	-0.71%	38.33%	19.69%	15.04%	-0.219	0.913	-0.571	2
ICIL	-11.74%	25.89%	6.16%	15.76%	-0.011	0.913	-1.95	2
ICIR	-19.53%	22.44%	7.45%	16.70%	-1.328	0.913	1.571	2
KTKM	-10.00%	18.48%	1.65%	11.08%	0.823	0.913	0.525	2
LICH	-16.79%	29.45%	7.72%	16.85%	-0.39	0.913	1.08	2
MCEI	-8.55%	105.88%	47.70%	52.96%	0.006	0.913	-2.852	2
MUTT	-28.92%	58.98%	27.44%	33.97%	-1.499	0.913	2.502	2
PWFC	-3.05%	238.82%	55.13%	103.06%	2.195	0.913	4.857	2
RECM	-6.42%	254.38%	57.05%	110.89%	2.178	0.913	4.793	2
SBI	-17.62%	67.47%	22.31%	31.90%	0.311	0.913	0.229	2
SBIC	-14.29%	9.06%	-5.59%	10.66%	1.178	1.014	0.503	2.619
SBIL	-5.96%	32.26%	8.53%	15.79%	0.965	0.913	-0.291	2
SHMF	-8.29%	49.12%	22.19%	22.99%	-0.117	0.913	-1.221	2
Nifty Services Index	4.47%	13.96%	10.12%	3.77%	-0.731	0.913	0.161	2

Source: Author Calculation

Table 3: Sharpe Ratio Analysis of Selected Financial Services Stocks

Stock	Mean Return (%)	Standard Deviation (%)	Risk-Free Rate (%)	Sharpe Ratio	Rank
AXIS	8.78	21.03	6.69	0.0993	12
BJFN	11.12	17.53	6.69	0.2528	9
BJFS	15.06	39.19	6.69	0.2136	10
CHLA	33.69	28.66	6.69	0.9422	1
HDBK	6.93	4.33	6.69	0.0559	15
HDFA	8.43	28.57	6.69	0.0609	14
HDFL	0.18	10.82	6.69	-0.6021	19
ICBK	19.69	15.04	6.69	0.8645	2
ICIL	6.16	15.76	6.69	-0.0339	17
ICIR	7.45	16.7	6.69	0.0454	16
KTKM	1.65	11.08	6.69	-0.4551	18
LICH	7.72	16.85	6.69	0.061	13
MCEI	47.7	52.96	6.69	0.7743	3
MUTT	27.44	33.97	6.69	0.6108	5
PWFC	55.13	103.06	6.69	0.47	7
RECM	57.05	110.89	6.69	0.4541	8
SBI	22.31	31.9	6.69	0.4898	6
SBIC	-5.59	10.66	6.69	-1.152	20
SBIL	8.53	15.79	6.69	0.1165	11
SHMF	22.19	22.99	6.69	0.6744	4
NIFTYFIN	15.25	18.50	6.69	0.4624	Benchmark

Source: Author Calculation

Table 4: Comparative-Stocks vs. Nifty Financial Services Index

Rank	Stock Symbol	Mean Return (%)	Standard Deviation (%)	Risk-Free Rate (%)	Sharpe Ratio	Compared to NIFTYFIN (0.4624)	Performance Category
-	NIFTYFIN	15.25	**18.50**	**6.69**	**0.4624**	**Baseline**	**Benchmark**
1	CHLA	33.69	28.66	6.69	0.9422	Higher	Best Performer
2	ICBK	19.69	15.04	6.69	0.8645	Higher	Top Performer
3	MCEI	47.70	52.96	6.69	0.7743	Higher	Strong Performer
4	SHMF	22.19	22.99	6.69	0.6744	Higher	Strong Performer
5	MUTT	27.44	33.97	6.69	0.6108	Higher	Strong Performer
6	SBI	22.31	31.90	6.69	0.4898	Higher	Moderate Performer
7	PWFC	55.13	103.06	6.69	0.4700	Similar	Moderate Performer
8	RECM	57.05	110.89	6.69	0.4541	Lower	Below Average
9	BJFN	11.12	17.53	6.69	0.2528	Lower	Below Average
10	BJFS	15.06	39.19	6.69	0.2136	Lower	Below Average
11	SBIL	8.53	15.79	6.69	0.1165	Lower	Weak Performer
12	AXIS	8.78	21.03	6.69	0.0993	Lower	Weak Performer
13	LICH	7.72	16.85	6.69	0.0610	Lower	Weak Performer
14	HDFA	8.43	28.57	6.69	0.0609	Lower	Weak Performer
15	HDBK	6.93	4.33	6.69	0.0559	Lower	Weak Performer
16	ICIR	7.45	16.70	6.69	0.0454	Lower	Poor Performer
17	ICIL	6.16	15.76	6.69	-0.0339	Lower	Poor Performer
18	KTKM	1.65	11.08	6.69	-0.4551	Lower	Worst Performer
19	HDFL	0.18	10.82	6.69	-0.6021	Lower	Worst Performer
20	SBIC	-5.59	10.66	6.69	-1.1520	Lower	Worst Performer

Source: Author Calculation

Table 5: Sector-wise Sharpe Ratio Comparison of Financial Services Stocks

Sector	Stocks Included	Average Sharpe Ratio	Comparison with NIFTYFIN (0.4624)	Performance
Private Banks	ICBK, AXIS, HDBK	0.3399	Lower	Moderate
Public Banks	SBI, SBIL, SBIC	-0.1819	Lower	Weak
NBFCs	CHLA, BJFN, BJFS, RECM, PWFC	0.4879	Slightly Higher	Strong
Insurance	ICIR, ICIL, LIC, HDFL	-0.1324	Lower	Weak
Housing Finance	HDFL, KTKT	-0.5286	Much Lower	Worst
Asset Management	MUTT, SHMF, MCEI	0.6865	Much Higher	Best

Source: Author Calculation

Interpretation

Table 1 shows the stock returns of financial services companies from 2020 to 2024 show significant fluctuations, reflecting market trends and company performance. The Nifty Financial Services Index maintained stable growth, while individual stocks exhibited varied returns. Stocks like MCEI, MUTT, and PWFC showed strong performance, particularly in 2023 and 2024, indicating investor confidence. In contrast, stocks such as AXIS, SBIC, and KTKM faced multiple years of negative returns, suggesting business challenges. Some stocks, including BJFS and ICIL, experienced high volatility, making them riskier investments. Overall, stock performance varied widely, emphasizing the need for careful selection based on risk and market conditions.

Table 2 shows the descriptive statistics of stock returns reveal key insights into performance, volatility, and distribution. RECM (254.38%) and PWFC (238.82%) recorded the highest maximum returns, reflecting substantial price gains, while MUTT (28.92%) saw the largest decline, indicating a higher risk. Mean returns highlight MCEI (47.70%), RECM (57.05%), and PWFC (55.13%) as top performers, whereas SBIC (-5.59%) shows negative growth. Volatility, measured by standard deviation, is highest for RECM (110.89%) and PWFC (103.06%), while HDBK (4.33%) and NIFTYFIN (3.77%) are more stable. Skewness reveals BJFS (2.094), PWFC (2.195), and RECM (2.178) with positive tendencies for high returns, while ICIR (-1.328) and MUTT (-1.499) lean toward negative extremes. High kurtosis in BJFS (4.426), PWFC (4.857), and RECM (4.793) suggests frequent extreme price movements, while MCEI (-2.852) and BJFN (-2.632) show more stable distributions. Investors targeting high returns must accept higher risk, while those prioritizing stability should focus on low-volatility stocks. Analyzing skewness and kurtosis aids in assessing the likelihood of extreme price changes, supporting better investment decisions.

Table 3 shows the Sharpe ratio analysis evaluates risk-adjusted returns, guiding investment decisions. CHLA (0.9422) leads as the best performer, followed by ICBK (0.8645) and MCEI (0.7743), indicating strong returns per unit of risk. SHMF (0.6744) and MUTT (0.6108) also show favorable risk-return trade-offs. Moderate performers like SBI (0.4898) and PWFC (0.4699) maintain stability, while BJFN (0.2528) and BJFS (0.2136) offer lower but acceptable returns. Stocks with negative Sharpe ratios, such as HDFL (-0.6021) and SBIC (-1.1519), underperform relative to the risk-free rate, making them less attractive. Investors should prioritize stocks with higher Sharpe ratios for better risk-adjusted gains.

Table 4 shows the analysis compares financial services stocks with NIFTYFIN, highlighting varying risk-adjusted returns. Stocks like CHLA, ICBK, and MCEI outperformed, ranking as top performers. Moderate performers, including

SBI and PWFC, showed stability, aligning with the benchmark. Below-average stocks, such as RECM and BJFN, underperformed, while weak stocks like AXIS and LICH offered minimal returns. Worst performers, including SBIC and HDFL, had negative Sharpe Ratios, indicating high risk. This study emphasizes the Sharpe Ratio's role in investment decisions, guiding investors toward optimal risk-return trade-offs.

Table 5 Shows the sector-wise Sharpe ratio analysis highlights risk-adjusted performance across financial segments. Asset Management (MUTT, SHMF, MCEI) leads with 0.6865, outperforming the NIFTYFIN benchmark (0.4624). NBFCs (CHLA, BJFN, BJFS, RECM, PWFC) also perform well with 0.4879, slightly above the benchmark. Private Banks (ICBK, AXIS, HDBK) show moderate performance (0.3399), while Public Banks (SBI, SBIL, SBIC) underperform (-0.1819). Insurance (ICIR, ICIL, LIC, HDFL) remains weak at-0.1324, and Housing Finance (HDFL, KTKM) is the worst, with-0.5286.Asset management firms and NBFCs offer superior risk-adjusted returns, making them favourable investments. Public banks, insurance, and housing finance sectors underperform, making them less attractive.

8. Conclusion

The study provides a comprehensive evaluation of the risk and return characteristics of financial services stocks in India, focusing on performance metrics, volatility, and sector-wise comparisons. By employing descriptive statistics and the Sharpe ratio, the research highlights significant variations in stock performance, emphasizing the importance of risk-adjusted returns in investment decision-making. Stocks such as RECM and PWFC recorded the highest maximum returns, while MCEI, RECM, and PWFC emerged as top performers based on mean returns. However, high volatility in certain stocks indicates that substantial returns come with increased risk.

The Sharpe ratio analysis reveals that CHLA, ICBK, and MCEI offered the most favourable risk-return trade-offs, making them attractive investment choices. Moderate performers, including SBI and PWFC, maintained stability, while weaker stocks such as SBIC and HDFL demonstrated negative Sharpe ratios, indicating poor risk-adjusted performance. The sectoral comparison further reinforces these findings, with asset management firms and NBFCs leading in risk-adjusted returns, whereas public banks, insurance companies, and housing finance firms underperformed relative to the benchmark.

Overall, the study underscores the importance of using quantitative measures like the Sharpe ratio to assess stock performance beyond absolute returns. Investors seeking strong risk-adjusted returns may find asset management firms and NBFCs more favourable, while those with a lower risk appetite should be cautious with public banks, insurance firms, and housing finance stocks. These insights provide valuable guidance for portfolio optimization, supporting informed investment decisions in the financial services sector.

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